

AVIATION

The Oldest American Aeronautical Magazine

NOVEMBER 28, 1927

Issued Weekly

PRICE 20 CENTS



Action photo of a Boeing mail plane (Wasp) on the Chicago-San Francisco route

VOLUME
XXIII

NUMBER
22

Special Features

The Ireland Amphibian
Radio and Air Commerce
The Bendix Wheel and Brake

AVIATION PUBLISHING CORPORATION
250 WEST 57 STREET, NEW YORK

Publication Office, Highland, N. Y. Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office, at Highland, N. Y. under Act of March 3, 1879.

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- Best soft type landing gear
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"I have flown over all of America and Europe in commercial machines but the Ryan Brogham has them all beat for performance and all around good quality."

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Pilot of Air, Army
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Ownership of a Ryan Brogham assures you of the utmost in a modern airplane. Wright Whitworth equipped, \$5,700 at San Diego.

COLONEL LINDBERGH'S "Spirit of St. Louis"—Reinforced the coming of the five-place Brogham.

The nation wide approval of his plane is again reflected in this latest product of the B. F. Mahoney Aircraft Company, a Brogham, luxurious in its appointments.

For instance, the cabin is completely upholstered in a rich blue velvet,

The B. F. MAHONEY AIRCRAFT CORPORATION, San Diego





*That's why
More Pilots fly them'*

THE extensive use of the Ryan Brougham on mail routes on the Pacific Coast has demonstrated it to be a worthy companion of its sister ship "The Spirit of St. Louis".

The remarkable performance of this plane is built upon sound engineering design plus excellent construction—and the installation of Wright Whirlwind Engines. Deeply cushioned chairs, heavily insulated cabins, easy of access with splendid ventilation, together with

excellent vision all combine to provide convenience and comfort for both passenger and pilot that is unusual. The durability, reliability and safety of Wright Whirlwind Engines in private flying is proverbial. Their splendid performance in the many overseas flights and in over 4,635,000 miles of military and commercial flying during 1926 confirms the fact that experienced fliers and aural commercial operators have in this Superlative Engine

Sent for Bulletin No. 17 B.

WRIGHT AERONAUTICAL CORPORATION, Paterson, N. J., U. S. A.

WRIGHT
Whirlwind
A SUPERLATIVE AERONAUTICAL
engine



The Oldest American Aeronautical Magazine

Vol. XXIII

NOVEMBER 25, 1927

No. 22

Opening of Congress Nears

CONGRESS WILL convene on Dec. 3, and from then until spring there will come from Washington some of the greatest importance.

The President's Message is always an index which sets the probable extent of the activities of government action for the next fiscal year. This year it is said to contain much of importance owing to the great personal interest President Coolidge has taken in domestic events. Then the Budget submitted by the President to Congress might be of great importance, as he has increased allowances for the aeronautical activities of the Government. The acute mind of Brig. Gen. Led, director of the Budget, has absorbed much of the aeronautical enthusiasm that has been in evidence in Washington, and his budget allotment for the various agencies, with the sanction of the President, will give it, it is believed, give added encouragement to all.

The Comptroller of Congress will have their bearings on which will come the most of information that serves as a guide. The Senate on the floor of the House reflect the sentiment in various parts of the country. Possibly an investigation or two will be started—or have it will be remarkable if they are not. The heads of Departments and Bureaus will make reports upon the record of their work for the year in summary.

Our readers may expect for a few hours to find a first account of each news in AVIATION, but when Congress settles down to its routine procedure, every day, including papers, will get back to normal.

More Honors

NOW THAT the open season for trans-Atlantic flying is over, there has been a natural desire to sum up the experiences of the first so much information as possible. The first general meeting was held in Washington at the time of the presentation of the Hubert H. Smith of the National Geographic Society to Col. Charles G. Smith by President Coolidge. And Beechcraft held a meeting at which practically everyone was described by one of the participants with specific reference to weather conditions. Out of the experience has come several very definite conclusions that will not only affect overseas weather forecasts but all weather predictions for airmen.

One point was very clear. The weather men and the pilots do not speak the same language. At a conference there have been misunderstandings that may be avoided in the future. Shipwrecked have used the weather reports so long that they have developed a terminology which is clear to all.

It has been found that this is not the case with them. The importance of a clear understanding of terms was one of the important results of the conference.

Another suggestion was made concerning the necessity of reporting reports of wind velocity and direction from different altitudes. Reports, all reports have been concerned with surface conditions. This had not proved satisfactory and the service will have to be augmented to include altitude observations if the weather reports are to be of the greatest value. Other similar conferences will be held and many constructive suggestions made as to the improvement of conditions surrounding experimental flights of the future.

Make Profits

EVEN FROM the earliest days of aeronautics many men have been making a living and even making money out of flying but there have been an even larger number who have stayed in the game because they were passionately fond of it. There have been some men who have made money out of investing in aeronautical ventures but the majority of those who have put up money have done so for the sake of the adventure and interest. The interest and money of these men have done much to stimulate commercial aviation and to keep the game alive but it must also be admitted that they have done much harm for their competition has been unfair to those who were trying to make a decent profit.

Two main complaints can now be laid on the fact that aviation is to grow it must be made to make money. Any enterprise which undertakes to sell either goods or service below cost is not only losing the seeds of its own ruin but is working a permanent injury on the whole aeronautical industry. Fortunately American aviation is not based on governmental subsidy but in many cases aeronautical enterprise have been based on what might be termed private subsidy. In the initial stages this was perhaps right but it is not altogether fortunate that there has been sufficient wealth in the country to be willing to back ventures which were almost certainly doomed to failure.

It has been proved that both the operation and the manufacture of planes can be done profitably but those who are being encouraged by groups have said there who through the expenditure of capital are operating or manufacturing below actual cost. These groups expect to be able to produce at a lower cost than their experienced competitors and are probably sincere in feeling that their ability and facilities justify their price cutting but in the long run they almost inevitably find that they are wrong. No industry is permanently helped by trying to produce goods or service below cost. A decent profit is one of the essentials in the growth of an industry.



A model radio tower of the type likely to be installed in American Airports

Radio and Air Commerce

A Review of its Values to the Pilot Aloft Which Justify Continued Adoption

By LAWRENCE A. HYLAND

Article One

THE AVIATION industry of this country has been given tremendous impetus by means of the recent operations of long distance flights. Public attention has been focused on airplanes and engines, pilots and navigators, and on rubber rafts and rafts.

Those of us who are immediately concerned with the future of aerial navigation need not look far, these flights are events, but have exposed them as difficult trials in which everyday problems raised in the "old" power were solved or pointed out for the benefit of the future industry.

The outstanding feature of the transatlantic flights and of the second Ford Reliability Tour has been that American aerodynamics and engine design appears to have progressed farther than has aerial navigation and communication. Actually, such is not the case. Navigational aids of great reliability, simplicity and precision have been developed, efficient radio communication equipment has been developed, but there is no demand for either as yet. In Europe, on the other hand, the development and use of radio for aircraft communication and navigation purposes has kept pace with the advances made in airplane and engine performance. This is one of the results of the world difficulties under which the Air Commerce of the two continents has been complicated.

It is necessary to consider the reasons for the divergence in the American and European aviation radio policy in order

that the future place of radio in the air commerce of the United States may be determined.

Government aviation already is the primary reason for the use of radio in European commercial aircraft during the last few years. This industry worked two ways. It gave the government the right to specify what type of radio equipment be used and what emergency equipment should be used. Also operations were restricted from low day to high one and reverse systems. Hence the aircraft and engine had been of advanced design, capable of carrying heavy loads. Moreover nearly all European governments have legislation, making the use of radio compulsory in all air transport. The operating companies supported the advantages of radio communication and direction as evidenced by costs or reasonable weights, were in compliance with the government regulations by installing radio equipment.

Airline Operators Must Pay Own Way

American airline operators have always been extremely of paying their own way. They have not supported the development of the commercial use of radio in these underpowered machines. Every dollar radio would have been an added dollar on the ticket. The U. S. Air Mail was not authorized the purchase of the airplane. Schultz & Hovell's telephone for their field capacity. Furthermore, the model radio equipment of the government was built along military lines, unsuitable for commercial use.

November 28, 1937

by reason of special features which add much to the weight and cost.

Until this summer, European conditions demanded radio installation to a far greater extent than did the American situation. The bulk of air traffic on the continent has been passenger transportation. Thus, too, the ocean channel route to avoid the carrying of passengers over a bad area of water for a distance of several hundred miles. Obviously they often had to be made to guard the lives and comfort of the passengers also these would have been no commercial airlines.

In the country there has been no extensive passenger traffic. The competitive law that have been made use of air transport even as a sporting proposition. There is a rapidly growing. A few freight routes were in operation mostly as business to government lines. Only in the Air Mail were operations conducted as a whole which would have warranted the use of radio equipment. However, the character of the service, the results without radio and the state of the radio at that time contributed to the same use of wireless equipment on any less experienced flights.

The year 1937 has seen far reaching changes in American aviation. The public has become aware that aircraft are not for carrying mail only but the common use than that of the military. The carrying of mail by air has been turned over to private enterprise. Congress has built into the law of the common carrier and has equipped and partly provided for a system of airways throughout the country. A great aviation company has entered the field. Hereafter the air commerce of this nation will expand rapidly and in a few years the same operating companies will differ little from those which have been found in the European aviation.

European air transport operations have shown that the installation of suitable radio equipment aboard the aircraft is a condition with an adequate ground system provides an aid to the pilot in receiving meteorological information for use in the air, in the case of distress and



Fig. 1. Map of the present and proposed French air routes

AVIATION

1283

Directly obtain speedy relief, and to secure navigation and when flying through fog or other inclement weather. That there are not theoretical disadvantages is evidenced by the fact that European governments after years of trial are installing wide extensions to the existing radio facilities to the end that a complete ground radio system may be available to aircraft. In Fig. 1 is shown a sketch of the French air radio system now in operation and in the progress of installation. The 82 stations are made up of eight with a range of 500 km, 31 with a range of 300 km, 26 with 100 km, and 17 with 50 km. It should be remembered that the ground organization has been built up around daytime flying for as yet the French have confined their night flying to experimental work. Notwithstanding the fact that such a comprehensive radio system will be installed at night. Another major point is that the number of radio stations installed is greater than the number of landing fields, due to the location of several types of radio stations at the more important fields.

Installations Required by European Governments

For the airplane, equipment and operating regulations are based on more direct cooperation with international agreement the principal European governments require, by statute or regulation, the following installations on public air transport:

1. For the larger aircraft (the passenger or mail) equipment capable of sending and receiving either intercepted or continuous waves on two wavelengths.
2. For the smaller craft (less than six persons) equipment for sending and receiving intercepted waves on two wavelengths.

Furthermore the governments have nearly all indicated that in the near future a licensed operator desiring his entire time to be used for the larger planes, while on the smaller a licensed operator will be required but may be the pilot. As a matter of fact the larger air lines have found radio to be of such value that a separate operator is already provided on the larger craft.

In the United States the need for adequate radio equipment on air transport and on landing fields will be greater than that which has been found to exist in Europe. The difference between the two continents is that the American air lines are far more of those on the European routes. Weather conditions are subject to under normal conditions and occasional severe weather conditions. Fog is hardly less of a problem than in the French coast. Increased traffic will bring the same conditions of disturbance or operation that the multiple plane routes of English, French and German companies now have. The rugged terrain of the eastern, western and northern mountain chains on the American continent, and the variety of landing places throughout these areas make equipment and emergency provisions of prime importance.

The ground aviation radio organization in the United States is, at present, a government function. As with aviation radio the government will probably set up and operate stations as a matter of public policy during the pioneering period. Whether these aircraft ground stations will be ultimately based on private enterprise is a matter for the future to determine.

Three branches of the Department of Commerce are now concerned with the radio equipment of the landing fields and intermediate stations of American air routes. In general the duties of each are as follows: Bureau of Standards; Development and Technical Problems; Bureau of Lighthouses, Buoyage and Aids to Navigation; Bureau of Aeronautics; Coordination.

In addition to recognizing the importance of the commercial

nal aviation industry by the creation of a Bureau of Aeronautics within the Department of Commerce, Congress also made an appropriation for the establishment of postoffice airways. It is with a part of this fund that the three Bureaus are proceeding with the development and installation of proper radio equipment on air routes.

The Bureau of Standards has developed some excellent work especially that in connection with the radio beacon. A comprehensive research policy has been inaugurated.

The Bureau of Lightships on which develops the actual construction and operation of the stations along the airways is proceeding as fast as funds will permit. The greatest effort of this year is in the development of lighting systems on airways. These radio devices are being developed and made available at all shore commandable brought on the part of the officials of the Department of Commerce, for it must be admitted that there is now an extremely limited demand for such service.

An Operator's Expense

Radio equipment on the aircraft itself is not and probably never will be a government function, except in a regulatory way. It is the operator's expense to own, provide and pay for the equipment, who must train his pilots or hire radio operators. There is little likelihood that radio equipment will be required by law on even passenger aircraft for many years. In the meantime it will be widely among the standard equipment of those aircraft which are to have radio on its credit. Who refuses itself to the problem—Does the dollars and cents value of radio on an aircraft promise a fair return on the investment in material costs and personnel salaries?

For navigation purposes alone radio will prove valuable to the air transport operator. Any one of several direction finding methods make possible the flying of a predetermined course when no landmarks or lights are visible. Not a few of the accidents which have occurred in air and planes have been directly caused by fog or stormy weather which compelled the pilots to fly in a circle that they might follow their course by continued glimpses of landmarks. It has not been unusual for the planes to stay many miles off the usual route in such cases. Crashes have occurred, especially in mountainous regions where low flying in the effort to secure visibility is an invitation to disaster. Had radio direction finding been available the pilots would have done at any desirable height up to the ceiling of the airplanes with perfect assurance that they were on course and that no unexpected accidents would have been up out of the obscured atmosphere.

Pilot Can Keep Course

While storms and fog are not infrequently met with it is only on very rare occasions that a pilot may not find some altitude within his attainment which will offer him good flying conditions. If divergence it has not been practicable to effuse those altitudes above the clouds for the reason that as unknown craft would cause a drift that might place the unfortunate craft miles away from the destination with depleted gas supply and no available landing field. Informed by radio of proper weather conditions at his destination the pilot provided with direction finding service may stay normally above the clouds or through them at ample altitude sure that he is proceeding straight on his course, and returned only with the keeping of his plane in level flight.

Modern aircraft direction finding equipment has a reliable range far in excess of that required for any commercial flight. The equipment is very simple, easy to operate and is rugged. Meteorological service is another vital help to an air transport pilot. Notification of unexpected fog, squalls or vis-

ibility storms was received on the airplane and the pilot was able to change his course or his landing to avoid such conditions. Weather disturbances which affect airplane operations are serious for a limited time only. In the worst case the airplanes may land at any emergency field until the disturbance has passed. The short delay is not comparable to the danger of a wrecked airplane with possible loss of life. Some operations caused almost a series of crashes such as occurred at or near Chicago last spring when most planes failed to find the ground hidden by dense fog. For hours these planes circled the city until the gas supply had been exhausted. Then the pilots took to parachutes and the planes were left to crash to earth. Not the most successful procedure, to be sure. Especially when the same radio equipment was in suitable for direction finding was to be made use of for reception of weather information. More training in its operation is needed, possibly, though even the slight amount of skill necessary for such work is not required when in ground stations uses a radio telephone.

The value of emergency communication from aircraft is obvious in the case of importance. Provided with the proper apparatus a pilot can almost invariably send out some sort of warning before a forced landing. Location and aid to the rescue can be arranged by the ground station. This factor that is quickly taken into account and to establish by present methods. Even the movie has might have had benefit as used in the emergency airplanes contained the most rudimentary of emergency radio gear. The nature of operations on the aircraft of collection of distress signals, passed at once with it. After landing it is possible for the equipped craft to be supplied details of the trouble of the same injury but is interpreted the personnel. For emergency communication some additional equipment is required above that necessary for weather reports and direction finding. By the nature of the service to be performed this material must be exact and rugged. Modern design offers such devices at reasonably cost.

The pioneer pilots of the American Air Mail have demonstrated successful coverage and communication in complete their trips on schedule. The inevitable weather has not the severity of the weather conditions that have been in

Guess Who?



Some interesting years ago a photographer in a small plane was seen on the first airplane that he ever flew by the way, was constructed at Amsterdam, N.Y.

managed in establishing a reliable transcontinental service.

The development of improved radio sets for aircraft makes a necessary and successful for active operators to call upon their pilots for improved performance in the field of aviation. Modern, commercial aircraft radio equipment—either heavy, nor bulky, nor complicated, nor expensive. Only annual course seems to be required for the operator.

In the field of the above factors it would seem desirable for the pilot to have a radio operator to investigate the merits of a radio operator, to examine the conditions of the most successful and efficient radio systems being established in the industry, and to consider that the cost of an aircraft plane will buy radio sets for a whole squadron.

Radio Two by Mrs. Hyland will appear in an early issue of AVIATION.

Paint and Varnish Firm Buys an Air-King to Advertise Products

THE MORGAN Company, Peoria, Ill., claims the distinction of being one of the first American paint and varnish manufacturers to recognize the airplane as an item of business, and to advertise and operate a plane for the advertising of its products. A short time ago, a standard mail Air-King plane was delivered at Varnum Field, Peoria, to the National Airways System, Peoria, Ill. A crew of pilots was put to work with spray equipment and in less than two days the plane was completely finished in the



The "Air of Shaker" in flight.

single company's standard yellow and blue colors and lettered with the advertising. The company's name appears in large letters on the bottom side of the lower wing and its initials and slogan on other side of the fuselage. On the radio appears an enormous playing card, in the center of which is a reproduction of a label paint can. Above the card is the very appropriate name of the plane, "The Air of Shaker."

The Air of Shaker was purchased by The Morgan Company as an advertising agent and since its purchase it has been used more than twenty times, in which the company has been able to advertise and operate a plane for the advertising of its products. The Morgan Company is a paint and varnish firm, and the Air of Shaker is a biplane. The Morgan Company's products and the distributors are in the field of the Air of Shaker for advertising purposes, The

Air of Shaker is also used by the company executives for trips where time is a factor. Putting the plane in flight, G. W. Young, U.S. R.C., who was, during the World War, an instructor in advanced short flying school, who has the additional advantage of being an experienced pilot and a valuable salesman.

A daily log is kept by the pilot, which shows the time varied with distance between, number of hours flown, gas



Four quarter view of the Morgan Company's Air-King plane.

and oil consumption, location and condition of landing fields and a general summary of operations. To handle the operation of the plane outside the city limits, a separate crew of pilots, known as The Morgan Airways Company, was formed with Elmer Morgan, president; C. E. Reed, Jr., president; R. L. Felt, secretary; R. E. Reed, treasurer; and H. B. Sappington, Jr., general manager. The Morgan Company states that the publicity it has received to date is worth far over and above the amount of its investment and operating cost.

City Flying Laws Passed

THE CITY commission of San Antonio, Tex., recently passed a resolution requiring registration and licensing of all aircraft carrying passengers above the city limits. According to Acting Mayor "Pete" Wright the ordinance has been approved by F. D. Cramer of the Aeronautics Branch of the Department of Commerce.

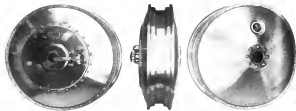
Planes used to be reported as "an aircraft of the United States of America" by simply stating the name of the Department of Commerce and pilots who operate them must obtain licenses from the department as "transport pilot" or as "limited commercial pilots." Traffic rules of the air are also provided in the new San Antonio ordinance. Aeronautics flying is prohibited and a fine of \$200 is provided for violation of any section of the ordinance. Acting Mayor Wright said the ordinance would be strictly enforced.

Nibbling Machine Saves Time

THE TIME taken to cut intricate shapes out of sheet metal can be considerably reduced by the use of a "nibbling machine." The usual procedure in cutting odd shapes is to drill a number of holes and saw and file between them. This method is eliminated by the use of a nibbling machine now being produced by Andrew G. Campbell, Inc., of Bridgeport, Conn., an associate member of the American Iron and Steel Institute. Nibbling machines of various sizes are produced from 1/2 to 2 1/2 ft. The machines can cut metal from 3/32 to 3/8 in. thick and still drill at from 30 to 90 faster inches per minute. The principle of operation is the punch and die, nibbling out small holes at a high speed.

The Bendix Wheel and Brake

Complete Brake and Disc Wheel Unit is
Now on Regular Production Basis



Left: Side view of the Bendix wheel. Center, front view of the 20 x 5 Bendix wheel and brake unit. Right, side view of the Bendix unit away from the brake drum.

AFTER EXTENSIVE experimentation and development the Bendix Brake Co., South Bend, Ind., has started manufacturing and shipment on a production scale of its first airplane wheel and brake. The brake is a complete unit contained in a disc wheel. It is a special free shoe servo brake developed for airplane work from the original Perrot disc brake. A number of tests made on ground service wheels were approved by the U. S. Army Air Corps. According to the manufacturer, Bendix wheels are standard equipment on Fairchild monoplane and are already in production for a number of other reputable aircraft companies.

First Production Shipments Oct. 1

Some time ago the company decided that an airplane brake should be a complete unit welded with the wheel and that the reason development was carried on with a disc wheel was incorporating a brake. At that time I. M. Laddin, who was connected with the U. S. Army Air Corps at McCook Field, had designed and tested an improved disc wheel of this type. In January of this year, after negotiations had been carried through, the Bendix company took over Mr. Laddin's rights in this disc wheel and incorporated with it a special two shoe servo brake. The period from January to the first of October of this year has been occupied with the preparation for production. During that time tests, etc., were prepared and now the organization can produce both wheels and brakes on a production basis in addition to carrying on its regular testing and research. On Oct. 1 the first production shipments were made.

The Bendix brake was designed with a view to dissipating

excess heat with a minimum weight. It is a combination of aluminum steampipe except for the axle pin, pin, nut, shaft and a few other small parts. The hub and disc wheels are parts of the wheel, are integral being a level of aluminum casting while the shoes, pins, and other parts are of aluminum alloy stock.

The Bendix is mounted on the cover plate which is made in direction of the axle due to the wheel. As the unit is actually contained within the wheel it was possible to design a wheel as one structure, form releasing the axle in a



The Bendix wheel and brake unit is a complete unit.

an axle. Besides the hub the only link in the form of a disc wheel is the valve stem and the brake lever on the main shaft. The spring required for the valve stem is the only one which will act on the outside of the wheel on the side opposite to that of the brake mechanism. The valve consists of a disc of aluminum connected to the standard 45 deg. valve stem. This extension is used to hold the hemispherical spring through the medium of a soft rubber faced metal seal. It is provided a water tight seal for the only opening in the wheel when the tire is on.

The wheel is riveted with a reinforcing ring at the rim of the wheel. This type of construction gives a wheel that is very strong, light and yet simple in construction.

Brake Action Simple

The action of the brake is very simple, a cone resting in the cone direction in the wheel, forces one of the shoes against the drum. This in turn forces the other shoe against the drum. After extensive tests it was found that a braking action directly on the surface of the heat treated aluminum brake drum is entirely satisfactory provided adequate cooling was in good. Better shoe followers are used, giving a simple mechanism that is quite sturdy and efficient. As the Bendix automobile brake, adjustment is from the outside by means of a secondary shoe adjustment (through a nut) as by changing the position of the actuating lever on the wheel.

Bendix wheels and brakes are now being produced in four sizes, 30 by 6, 32 by 6, 36 by 8, and 44 by 10. A 5 1/2 inch size of 54 by 12 is being developed for very large airplanes and will soon be on the market. Bendix wheels are available with or without brakes, the wheels without brakes being available for special purposes. The manufacturer states that they are the lightest airplane wheels ever built. The following table gives details of the sizes of wheels and brakes with their weight and weight.

Size	approximate Weight		Strength		Maximum Working Force
Wheel	Frame	Swivel	Wheel	Frame	Wheel Force
30 in.	25 lb.	60 lb.	25,000	20,000	10,000 lb.
44 in.	40 lb.	80 lb.	35,000	30,000	
54 in.	50 lb.	110 lb.	50,000	40,000	20,000 lb.
60 in.	60 lb.	130 lb.	60,000	50,000	25,000 lb.

It is stated that the test figures are conservative, taking into effect both actually made as production wheels.

Mail Service for San Antonio

MAILING A recent visit to San Antonio, Tex., by C. A. Mather of Fort Worth, representing the Texas Air Transport and A. S. Spencer, manager of the Fort Worth chapter of Commerce, announcement was made by Porter Olsen, manager of the local chapter of commerce, that air mail service would be available in San Antonio by Dec. 15. The air mail contact with the Dallas-Fort Worth line is through the Fort Worth mail terminal. With this in mind, it is stated as the local airport and passenger facilities, except for larger accommodations. Plans for construction of an additional hangar are now being discussed by the city.

New Firm Takes Over Business

THE AIRCRAFT systems of Charles Wood Hall, Inc., has been taken over by the new Hal-Aluminum Aircraft Corp. The company will manufacture all-metal aircraft, 100 and 150 seat airplanes. In addition it will make standard-sized freight containers and stamped parts. The new office of the Hal-Aluminum Aircraft Corp. is at 1111 N. 1st street, Dallas, Texas. The plants will be located at Amarillo, N. Y., and 3000 Elmwood Ave., Dallas, N. Y.

Ryan Brougham for New Zealand

INTEREST IN aviation in Australia is increasing at a tremendous rate and it is expected that within a short time large shipments of airplanes from the United States will be made to that country. E. A. Channing, associate of the Institute of Aeronautical Engineering at Sydney, Australia, told a representative of *Aviation* at San Diego, Calif., recently.

Mr. Channing went to San Diego with George E. Roberts, San Francisco exporter, the latter having purchased a new



E. A. Channing and George E. Roberts in front of a Ryan Brougham.

Ryan monoplane from the H. F. McHenry Aircraft Corp. for shipment to Wellington, New Zealand. Mr. Channing is one of the foremost aviation men in Australia.

The purchase of the plane has not been made known. It is known, however, that the plane will be flown in an ultramarathon flight from New Zealand to Australia, a distance of 13,000 mi.

"Everybody in Australia is enthusiastic over flying," said Mr. Channing. "Every flying field has a waiting list of students all anxious to learn to fly. From all indications the demand for training planes is so great that United States must be called upon to supply it."

Mr. Channing has just conducted a visit to various aircraft manufacturing plants and has reported and flown several types of planes. Mr. Roberts, the broker, shipped the plane to New Zealand early this month.

Increased Use of Flightex

THE E. S. Tenzing Co. of New York City, that markets the well known Flightex fabric for covering aircraft, reports a great increase in the demand for its high grade fabric. The Flightex and special treated fabrics are being used on a large number of the commercial aircraft being built in this country as well as on the aircraft for the government service.

The eight transport monoplane built by the Tenzing Air Manufacturing Co. of Wichita, Kan., for the National Air Transport was covered with Flightex fabric. These planes are in service daily between Chicago and Dallas, Texas, carrying passengers or freight to mail and express. The two famous Trans-Pacific Travel Air monoplanes, one flown by Smith and Houston and the other flown by "Art" Godwin, were covered with Flightex fabric.



A drawing of the proposed Armstrong Seadrome with landing deck 300 ft. above sea level.

Seadromes and Ocean Flying

Increasing the Safety Factors of Water Flying
With Floating Landing Fields

By E. R. ARMSTRONG

THEIR OUTSTANDING experience of trans-oceanic travel over the North Atlantic route in the extreme light hazard brought about because of weather conditions. Advance weather information which is absolutely essential for safe flying cannot be transmitted over the trans-Atlantic route without sea stations for the collection of information. The wide expanse of ocean covered by an airplane is twenty-four hours, makes it impossible to tell at the start of a trip what the weather will be at the other side of the ocean, they have later at the end of the voyage. It would be of little value to an American pilot to know midway on his flight that when he arrived at the English or French coast it would be too stormy or foggy to land. Boston, London, Rome and Charleston, the men who have flown the Atlantic, are so one in emphasizing the absolute necessity of "sea stations", "floating islands", "seadromes" and those with you, they insist that they must be an integral part of any system of safe transoceanic ocean travel by airplane.

In 1913 the writer made a study to determine where the airplane would eventually prove of most value from a transportation point of view. In examination it appeared that the trans-Atlantic route between America and Europe offered the most attractive airway development. Over it the largest number of people travel the greatest distances by relatively

a slow method of transportation. As a result the development of a seadrome system of anchored floating and moving stations was started, to permit the movement of the airplanes on the route. A seadrome has been designed and tested that fulfills all the requirements of such a venture. An anchoring system has been designed and it will be tested under actual working conditions. Another development schedule now being carried out is a trans-Atlantic Airway will be in operation by 1930.

May Reduce Forced Landings

The United States Post Office operating of the transoceanic air mail is the outstanding example of the most perfect air route development in the world. The "round trip" Transoceanic, Chicago-Sofias Airway, which only completed as long as the New York-Paris line, opened, it is said, not long, during the first year of operation, the number of passengers and perfect score of the trans-oceanic air mail. The United States Post Office operating of the transoceanic air mail is the outstanding example of the most perfect air route development in the world. The "round trip" Transoceanic, Chicago-Sofias Airway, which only completed as long as the New York-Paris line, opened, it is said, not long, during the first year of operation, the number of passengers and perfect score of the trans-oceanic air mail. The United States Post Office operating of the transoceanic air mail is the outstanding example of the most perfect air route development in the world. The "round trip" Transoceanic, Chicago-Sofias Airway, which only completed as long as the New York-Paris line, opened, it is said, not long, during the first year of operation, the number of passengers and perfect score of the trans-oceanic air mail.

Keeping in mind for the moment that both the air

and land including sea and seadrome stations not exceeding four miles apart, it is not illogical to forecast for a regularly scheduled trans-Atlantic route with seadromes at Newfoundland and other intermediate stops, a forced landing at sea or greater frequency. Weather conditions favorably affect flying are considerably more plentiful in the Atlantic route given, than on the Chicago-Sofias route. It must be accepted then as very probable that for every four trans-Atlantic trips at least one will encounter a storm when a forced landing due to weather should be made. Continued flight recovery by the lack of aid lead only to disaster. The inability to escape the weather over the North Atlantic will undoubtedly increase the expense incurred as compared to land routes. Obviously if twenty-five per cent of transoceanic travel are accompanied by forced landings in the ocean, it would prove an impossible commercial venture, one per cent or probably one per cent forced landings could condemn the service.

Flying over Atlantic commercially demands from its inception the highest degree of safety in operation. The Newfoundland route is ruled out by the ocean conditions that it is not safe, from a weather point of view. Storms are frequent and violent, fog, mist, ice and more are present during the greater portion of the year. The only recourse is that of the route is that it is the shallow areas along the coast, it is much too long for commercial airplane operation. Considerations such as these, and others just as many, developed by the writer as far back as 1913, started the development of the seadrome system of anchored airplanes and supporting stations, whose places would be actually supported, repaired and stored and the necessary maintenance operations necessarily attached to a land seadrome would be carried on.

Weather Determines Seadrome Locations

Consider for the moment the possibility and practicability of deep-sea seadromes, the construction of storm-proof seadromes protected by waves, of adequate area for an ocean airplane landing field, it is an once approved that the most favorable trans-Atlantic route can be selected from a weather and weather point of view, and stations spaced at such distances apart as may be determined as necessary for safety and economy in airplane transport.

Before considering the equipment comprising a practical seadrome system capable of performing a definite transport service, to estimate of the possible traffic that would be available on a trans-Atlantic air route between the United States and Europe will be given. The trans-Atlantic airway is the probability of increasing the best patronized and most profitable of any airway the world over. Approximately 1,000,000 passengers make the ocean crossing annually, equal

to the total passenger mileage of the Pennsylvania Railroad. Five thousand tons exceeds 10,000,000 pounds per year, instead of the usual 100,000,000 pounds, express considerably exceeding the latter amount. Careful income estimates based on approximately half of the trans-oceanic transportation ground by air as is now that would attract it and made possible by seadromes, the gross income as an air transport operation, will exceed \$500,000,000 annually, certainly a figure the unaided always of the world will require many years to attain. Commercially then the trans-Atlantic airway will nullify seadrome development.

Water Craft for Rescue Work

Weather conditions that would make advisable a flight interruption on the Atlantic route would frequently be accompanied by sea conditions that would make a sea landing by an airplane a hazardous operation while take off under such conditions would be impossible even with the largest flying boats. On this basis assumption the Armstrong Seadrome was designed for quick landing and take-off of planes. Sea landings of the flying seadrome normally using the system will be possible but impractical. It is quite practical to design planes with land take-off and landing with sufficient seaworthy qualities of sea take-off is not necessary. With stations spaced but 400 miles apart with one intermediate station in between, forced landing on the ocean would present an obstacle in itself, severe weathering the doubled planes via air as less than five hours and by surface could be held at the main and intermediate stations in about four hours. It is also obvious that many of the forced landings that would occur on the Newfoundland route would not happen in the southern route because weather forecasting would control flying schedules with the result that where bad weather occurred planes at that station of the route would be held at the station until flight could be resumed with safety. In addition the weather forecasts experienced on the Newfoundland route are much less prevalent in the more southerly routes selected, so that storms will be encountered with but ten per cent of the frequency with ice and fog almost never encountered.

Seadromes then must be of adequate area suitable for landing and take-off of the largest transport planes. In addition they must be storm proof without appreciable roll or pitch when subjected to the largest waves of the Atlantic. Further they must be securely anchored on the route selected and finally the capital cost and maintenance expense should be such as to permit a substantial return on capital investment with cost of transportation about that charged on the high speed steamships.

The dock area required for normal landing and take-off of transport planes may be estimated in accordance with the



Showing the stability of the Armstrong Seadrome in rough weather with a scale model of the S.S. Majestic

AIRPORTS AND AIRWAYS

Los Angeles, Calif.

By Charles F. McDevitt

The first man ever to buy a round trip ticket for a transcontinental flight was an individual on his way, Will Rogers, cowboy humorist, movie star, writer and politician, returned to Los Angeles after an absence of only three nights. He spent a night and part of a day in New York City. The latest passenger train leaving Los Angeles at the same time Will Rogers left by plane would not have reached New York by some hundreds of miles at the time that the first round trip transcontinental air passenger had returned to his wife and family.

Will Rogers flew the Western Air Express route, from Los Angeles to Salt Lake, in a Douglas mail plane piloted by James Jameson from Salt Lake City to Chicago he was carried by Boeing Air Transport in the Boeing mail plane, and from Chicago to New York by S.A.T. The return flight was uneventful, although his plane had been forced down in a safe storm near New York on the eastward flight, and he made the last leg from Salt Lake City to near record breaking time with pilot Al De Garmo at the controls.

This trip marks the beginning of heavy transcontinental air traffic and the number of men who have booked rounder flights in the past few days would seem to indicate that Los

Angeles, with its large number of actors and movie picture representatives who cross the country frequently, will guarantee a large percentage of such round-trip flights every day.

Raymond Hinton left for Chicago from Van Nuys, his day after Will Rogers had started, leaving seven hours before the wedding of a friend. Wallace Pratt, who spent nearly two years in the desert, was back in the desert, where he will confer with Jack Mahlon, owner of Madeline Air Lines, which operates the Ford plane between Los Angeles and San Diego.

Dr. Frank W. Chandler, Los Angeles dentist, has arranged to fly to Detroit and back for a dental convention, to take as he away from his patients for as short a time as possible.

These few instances are certainly but an indication of the vast amount of work flying which may soon be expected to be in progress all over the country.

The municipal airport situation in Los Angeles has this most interesting turn. Twenty-two airport sites have been submitted and a resolution has been passed favoring at least two and perhaps three airports. The city planning commission has requested all sites and narrowed them down to seven from which the final selection will be made. These seven are the Van Nuys, Burbank, Burbank, Mirna and Dominguez sites.

located to the east or south, and the Broom and Van Nuys sites to the north-west in the San Fernando Valley. The most a fraction counties in to report was open the possibility of an immediate purchase, on the other under consideration as high as three million dollars.

In the meantime the city of Long Beach, to the south, has completed plans for the enlarging of the Long Beach municipal airport to give a runway at over 3,000 ft. and to install up-to-date equipment at the field.

In a speech before the Los Angeles County Club, Capt. C. H. Hild, Governor of the Southern California N.A.A. organization, said the people that if an airport were not developed at once, Los Angeles would lose the 1939 air meet.

Capt. Walter J. Parker, Department of Commerce aeronautics inspector for Southern California, speaking at the same dinner, stated that in making his report try to Washington to report on local conditions he learned that twenty per cent of all planes and one third of all licensed pilots at the United States are located in Southern California. Capt. Parker announced that five additional inspectors will reach the district soon to be here in his work. He also disclosed the fact that the Department of Commerce has supplied him with a Ryan Droughtless plane for use in connection with his work in that district.

J. L. Mackie, Pacific Air Transport; E. C. England, and traffic manager of Western Air Express; Wallace Pratt, Mackie, Mr. Lister, and J. B. Alexander of the American Aircraft Corporation, Waco and Fairchild distributors, were among the prominent assembled guests.

The independence of the airplane to the modern business man, was the topic for a speech delivered by Theodore T. Hall, vice-president of the Pan-American Bank and president of the American Aircraft Corp., to the Downtown Business Men's Association at their annual banquet. Mr. Hall is a pilot and recently completed a round trip flight to New York, accompanied by Mrs. Hall.

Dr. Thomas G. Young, general flying promoter of the southeast, recently addressed the Hotel Merchants Association on the subject of aviation, predicting wide spread use for all phases, from the driver plane to the air liner, in the near future.

Harry H. Gilbert, president of the Los Angeles Realty Board, has left for an extended eastern tour by sea and predicts that the airplane will completely revolutionize the real estate business and the value of real estate by making out of the way spots accessible.

Alfred H. Hurd, local real estate dealer, has commenced operations with a six passenger Fokker cabin monoplane which makes weekly trips with prospective buyers to the location of Rancho Arroyo, a good real estate development near Phoenix, Ariz. The trip is decidedly novel, crossing the great wastes of Southern California, the Salton Sea, in the Imperial Valley; the salt lakes in the desert, and the mountains of Arizona.

To Regulate Starting

As this December moves to such dangerous start exhibitions in Southern California has been made by Charles A. Warren, head of the Warner School of Aeronautics, Los Angeles.

One of Mr. Warren's pupils recently made an uneventful parachute jump from a plane equipped with a balloon type chute and Mr. Warren accompanied by Capt. Walter Pratt. I might state testimony to the report that some accidents in all steel flying in this vicinity will be strictly regulated by law in the future, thus giving legitimate flying safety a big boost.

The Warner School of Aeronautics has more than 350 students enrolled in ground and flying courses. The equip-

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assumed that the organization throughout the state of other chapters of the N.A.A. will be his first concern as governor. As he is a teacher, it probably will not be long before there are chapters of the N.A.A. in many Georgia cities.

Candler Field has been the scene recently of several activities. Doctor Elixon, who is now president of aeronautics in the Georgia Military Academy here, flew a Ryan monoplane from San Diego to Atlanta. It is similar to the Lindbergh plane, has certain improvements, and carries five passengers and a pilot. It will be used for passenger short-range flights at Candler Field.

Douglas Deane flew a new Waco-20 from the Vance Detour at Troy, Ohio. It will be used for commercial flights at Candler Field.

Mr. Elixon flew from San Diego to Atlanta, 2180 mi., in 15 hr., 45 min., making four stops. Deane made the 850 mi. from Troy in a one-stop flight of 4 hr., 5 min.

Both planes are the first to be stationed at Candler Field equipped with Wright Whirlwind engines.

Atlanta's first aviation show included an excellent line of exhibits. It was held in connection with the third annual radio electrical exposition. Those planes were on view. They were an American Eagle, an Alouette for England, and a Waco-16. All were equipped with Curtiss OX-5 engines. Part 1811, which the exhibit was located in the City auditorium, had doors so small that the planes had to be hoisted down and re-built for the exhibit.

Commercial work on a developing rapidly in Atlanta. A new corporation has been organized by Douglas Davis, as president which will conduct a flying school at Candler Field, build planes, hold air mail routes, and gradually incorporate a passenger service in Georgia and perhaps other southern states.

The Atlanta Aero Service has been started by Don Mills,

with a flying school at Tangle Field, Decatur, a school at Atlanta. A considerable number of students are already ground courses and studying engine building and flying.

UNITED STATES AIR FORCES

Air Compiles Aviation Tests

Flying hand tests in many activities other than making the Army has found another planning field in the compilation of tests on aeroplanes. The progress of aviation development has been so rapid that the writing of notes and authoritative tests has not been able to keep pace. One for each test is five, as a consequence of which the compilation must of necessity be original work, which takes the present shape and different. In addition, new developments come so rapidly that tests become obsolete before they are re-written. Faced with the necessity of providing a more whereby instruction in aeronautics could be placed in a book form, the Army took up the task of compiling tests as a branch of the service.

That the results of this work are in demand is indicated by requests to the Secretary of War by aviation schools to permit them to use certain War Department aeronautical instruction documents as texts in the course of their school instruction. In reply, the secretary has stated that the War Department has an objection to the use of the documents provided for schoolwork to be given the War Department in one copy of the documents or parts thereof are repeated into school or other texts not Federal Government publications, and that such acknowledgment be incorporated in the report, and provided that the school comply with the Patent statute, which prohibits the re-use of any United States Government document as a profit.

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PUBLISHER'S NEWS LETTER

A visit to Friedrichshafen is always a pleasure that brings aeronautical visitors to a share of aerial progress. Here is the place where Count Zeppelin had his early vision of lighter-than-air development. Here, too, were made the early experiments in the use of lake boats and the all-metal airplane. Friedrichshafen was the site of the first airship hangar and the first dirigible. The Bodensee flew from here to Berlin as the first regular commercial airship route in the world. The important Dornier aerial development started under the supervision of Count Zeppelin has always included progressive ideas from this beautiful town on the shore of Lake Constance, or as it is termed in German, the Bodensee. During the war it was one of the important centers of airplanes, dirigibles and motor development. Since the aviation it has been but a shadow of its previous aeronautical glory. At Friedrichshafen the Los Angeles was built and the Dornier flying boat developed, but owing to limitations of the Versailles Treaty progress has been very much hampered. In 1926, the opportunity for construction of aircraft was greatly increased by a broadening of the restrictions by the Allied Commission. It was, therefore, interesting to observe this year the change that had come over the city during the last twelve months.

Of course, Dr. Hugo Eckener, head of the Zeppelin Company and the inventor of Count Zeppelin is the towering genius of the airship world and it was an exceptional courtesy to find him waiting at the dock for the arrival of his American visitors from Switzerland. Quite apart from the aeronautical interest that every visitor naturally feels in seeing the sleeker vessels at Friedrichshafen, the panorama for the comfort and entertainment of those who come to the city are exceptional. The Kurpark, a most carefully designed hotel, now located on the picturesque lake with an extensive view of the Alps. Here, guests are made to feel that they are more than passing visitors—they are shown courtesies that make them wish to prolong their stay and return whenever possible. Dr. Eckener and Captain Ernst A. Eckener, whose experience during the war with Zeppelins are well known throughout the aeronautical world reflected the enthusiasm that is felt by the German people over the construction of the new type of Zeppelin now being constructed. The life of the world here is dependent on the success of the aeronautical work that is being done here. During the period when the war hangars and shops of the Zeppelin works were empty, the downtown was not only financial but aerial. Dr. Eckener, through public subscription, has

gathered together funds to commence construction work again and everyone from the spectators to the hundred residents are looking forward to the time when airships will fly from their birthplace to all parts of the world to establish a network of lighter-than-air international commercial air routes.

The new Zeppelin that is under construction, as is generally known, has an intention that it change the whole trend of airship design. The fuel used will be a gas which is not greatly different from ordinary illuminating gas. It will be carried in gas cells which are placed below the ordinary hydrogen cells. It has been found that little change has to be made in the engines to use this gas instead of liquid gasoline. The fuel gas has about the same specific gravity as air. This permits long trips being made with little change in the weight of the fuel, whereas in the gasoline burning airships the fuel is very heavy at the start and decreases gradually during the voyage. Such a gas has been made that Dr. Eckener now plans to conduct the globe on a non-stop flight. The first long flight next year will be to the United States probably through without stopping to San Diego. Later it is hoped to put this ship into service between Europe and South America. As the plans provide for the completion of the new airship by spring it is not improbable that next year when the trans-Atlantic airship crossings are at their height that a new location of the ship will pass over the United States and demonstrate again the possibilities of this type of aircraft.

The design of this gas powered airship has many refinements and several notable changes. The type of girder that has hitherto been standard in Zeppelin construction has been improved and simplified and while it was previously too late to have all the day of this construction, it is being used very generally. It is not only stronger but very much cheaper to produce. The division of the interior of the ship into upper and lower sections to accommodate the hydrogen and fuel gas cells introduced a new longitudinal member which is believed will add to the strength of the airship. The power will be greatly increased by the use of new type of engines which are now planned to be built in Germany. With this German Zeppelin and the possibility of at least one of the English airships being completed in 1932, this branch of aeronautics will, it is believed in Europe, receive a great stimulus next year. Another task the work of Dr. Dornier will be described.

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